

Work Order ID 110108

110108

Page 1

December 17-13 9:15:12 AM

Item ID: D350-748-201

Accept

N9000040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Aft Crosstube

Start Date: 12/17/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/17/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: MLJ Date: 13-12-19 Tooling:

Date:

Run Start *NR1*

QC: Date: SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D350-748-241	G								

100

DOCUMENT CONTROL

100

DC

Document Control

Memo

Photocopy bluefile & type labels per PPPD350-748-201

CHG003

FEB 11 2015

DAS
06
9-89

110

BENDING MACHINE - CROSSTUBES

110

CNC Bend 2

CNC Alpha 160 Bender

Memo

Bend tube as per Dwg D350-748-241 using CNC bender program D350A and Folio FT

*****UNDER BEND "225" PER SIDE*****

*****USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS*****

JW
14-08-21

Work Order ID 110108

110108

Page 2

December-17-13 9:15:12 AM

Item ID: D350-748-201

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Aft Crosstube

Start Date: 12/17/13 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 12/17/13 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

120

QC6- Inspect dimensions to drawing

0.00

120

QC

Quality Control

Memo

USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS

0.00

Verify cross tube
dimension

JW 14-08-21

125

0.00

125

Outsource1

Outsource process - Heat Treat

Memo

ISSUE P/O TO METCOR: 25480

0.00

Stress relief

Heat treat crosstube as per QSI010 4.3 within 12h after bending

CL 14/08/21 ①

126

Receive & Inspect for Damage & Mat'l Certs

0.00

126

Packaging

Packaging

Memo

0.00

P-14/08/21 ①

Work Order ID 110108

110108

Page 3

December-17-13 9:15:12 AM

Item ID: D350-748-201

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Aft Crosstube

Start Date: 12/17/13 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 12/17/13 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

127	QC15- Crosstube Dimensional Check	0.00							
-----	-----------------------------------	------	--	--	--	--	--	--	--

127

QC

Memo

0.00

Quality Control

MARK CUT LINES

DAS
03
9-88

14-8-28

128		0.00							
-----	--	------	--	--	--	--	--	--	--

128

Crosstubes

Memo

0.00

Crosstubes

CUT TUBE AT HEIGHT ON FAI SHEET

SA-31.56
SB-31.6

✓ VERF HEIGHT BY QC 15 LEVEL INSPECTOR

VERF TWIST 0.023 BY QC 15 LEVEL INSPECTOR

14-9-2

DAS
03
9-88

Work Order ID 110108

110108

Page 4

December-17-13 9:15:12 AM

Item ID: D350-748-201

Accept

N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Aft Crosstube

Start Date: 12/17/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/17/13 Req'd Qty: 1.00

1

Customer:

Reference:

Run Start

NR1

Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop

NR2

QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

130

0.00

130

Crosstubes

Crosstubes

Memo

0.00

Crosstubes

2- Drill Tube as per Dwg D350-748-241 Using DT8876 Drill Jigs,
Set-up drill table as per QSI 010

3 -Deburr

4- Engrave Part # and Batch # as per Dwg D350-748-241

5-Remove all marks from tube within limits of D350-748-241



mm

14 / 09 / 04

BSL

14-09-04

140

QC6- Inspect dimensions to drawing

0.00

140

QC

Memo

0.00

Quality Control

DAS
38
8-89

NOV 21 2014

Work Order ID 110108

110108

Page 5

December-17-13 9:15:12 AM

Item ID: D350-748-201 Accept *N900040100* Setup Start *NS1*
 Revision ID: Stop *NS2*
 Item Name: Aft Crosstube
 Start Date: 12/17/13 Start Qty: 1.00 *1* Cust Item ID:
 Required Date: 12/17/13 Req'd Qty: 1.00 *1* Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150	Outsource process-Cadplate per QSI017 4.1.9.1	0.00							
150									
Outsource3	Memo	0.00							
Outsource process - Cad plate	Issue P/O: <u>26611</u> Stress relief at 375° for 5 hours Magnetic Particle Inspect per ASTM E1444 Cadum Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375° for 8 hours, Chromate Treat Possible Supplier: Southwest United Industries Ensure Certificate of Conformity is attached								<u>CZ 14/11/25 @</u>
160	Receive & Inspect for Damage & Mat'l Certs	0.00							
160									
Packaging	Memo	0.00							
Packaging	Ensure certificate of conformity is attached								<u>1x SP1501-27</u>
170	QC5- Inspect part completeness to step on W/O	0.00							
170									
QC	Memo	0.00							
Quality Control									<u>① 150123</u>

DAS
9
9-89

Work Order ID 110108***110108***

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December-17-13 9:15:12 AM

Item ID: D350-748-201

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Aft Crosstube

Start Date: 12/17/13 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 12/17/13 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

174

Outsource process - NDT per QSI038 4.1

0.00

174

Outsource2

Memo

0.00

Outsource process - NDT

ISSUE P/O TO ACCUREN: 27247CL 15/01/29 @

176

Receive & Inspect for Damage & Mat'l Certs

0.00

176

Packaging

Memo

0.00

Packaging

IX 8015-01-29

178

QC5- Inspect part completeness to step on W/O

0.00

178

QC

Memo

0.00

Quality Control

DAS
38
9-89

JAN 30 2015

Work Order ID 110108

December-17-13 9:15:12 AM

110108

Page 7

Item ID: D350-748-201

Accept

N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Aft Crosstube

Start Date: 12/17/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/17/13 Req'd Qty: 1.00

1

Customer:

Reference:

Run Start

NR1

Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop

NR2

QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

180

0.00

180

SprayPaint

SprayPaint

Memo

0.00

Spray Painting

1-Prime inside crosstube as per QSI 005 4.2

BATCH: m129801

2-Paint Outside of Tube as per Dart QSI 005 4.2

BATCH: m131122

1

CR 15-02-01

190

0.00

190

QC

QC14- Inspect Spray Paint

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

15

15-02-02

Work Order ID 110108

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Item ID: D350-748-201

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Aft Crosstube

Start Date: 12/17/13 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 12/17/13 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

200

0.00

200

Crosstubes

0.00

Crosstubes

Memo

INSTALL GROUND WIRE INSERT, THEN INSERT SCREW AND WASHER

1-Abrade mating surfaces of support and crosstube with 180 grit sandpaper, clean the area with MEK or equivalent as per dwg

2-Install supports with Proseal 890 per D350-748-241 and QSI 015

A/R Proseal 890 Batch: 170986
EXP: 6/15

3-Install supports clamps Using Dt8876 as per Dwg D350-748-241, Torque to 60-80 IN-LBS.

PROSEAL CURE TIME 72 HOURS:

Start: 15-02-05
Finish: 15-02-08

1 _____ CR 15-02-05

210

QC5- Inspect part completeness to step on W/O 0.00

210

QC

Memo

0.00

Quality Control

RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED FOR 72HOURS AS PER DWG.

1 _____ DAS 38 9-88 15-02-10

Work Order ID 110108

December-17-13 9:15:12 AM

110108

Page 9

Item ID: D350-748-201

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Aft Crosstube

Start Date: 12/17/13 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 12/17/13 Req'd Qty: 1.00 *1*

Customer:

Reference:

Run Start *NR1*

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop *NR2*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
220	Pick Kit	0.00							
220									
Packaging	Memo	0.00							
Packaging									
230	QC4- 100% Inspect kits for completeness	0.00							
230									
QC	Memo	0.00							
Quality Control									
240		0.00							
240	Packaging								
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPPD350-748-201								
	Location: 035								
	PPP Rev: _____								

DAS 26 9-89
FEB 10 2015
DAS FEB 11 2015
46
9-89

FEB 11 2015 DAS
06
9-89

DA 46 9-89
FEB 12 2015
DAS 06 9-89

Work Order ID 110108

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110108

Page 10

Item ID: D350-748-201

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Aft Crosstube

Start Date: 12/17/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/17/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

250

QC21- Final Inspection - Work Order Release

0.00

250

QC

Memo

0.00

Quality Control

MLJ 15-02-12

MF
15-2-12

Picklist Print

December-17-13 9:15:11 AM

Page 1

Work Order ID: 110108
Parent Item: D350-748-201
Parent Item Name: Aft Crosstube

Start Date: 12/17/13
Start Qty: 1.00

Required Date: 12/17/13
Required Qty: 1.00

7

Comments: IPP Rev: A New Issue 06-07-05 JLM
IPP Rev: B Update qty of MS21042L5 06-09-12 KJ
IPP Rev C Combined manufacturing 08.04.02 EC verified by: DD
IPP Rev:D 08-06-24 revD as per dwg DD verified by:EC
IPP Rev: E 08.12.11 Step17 was step 21 KJ Verified by:EC IPP Rev:F 10.08.04 added QSI010
4.3 DD verf:EC IPP REV:G ADD UNDER BEND COMMENT 12-05-28 JLM IPP
REV:H 12.11.05 as per dwg D350-748-141G DD verf:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued DAS	Date Issued	Status
ALS4-1032-225 Rivnut		Purchased	No			200	Each	848.0000	1	1	41 9-89	15-2-7	
				Location		Loc Qty		Loc Code					
				FG		30							
				M127028		30							
				ST280		129							
				M125954		20							
				M127028		109							
				st555		689							
				M127092		689							
AN4-41A Bolt		Purchased	No			220	Each	674.0000	8	8	DAS 46 9-89	DAS 26 9-89	
				Location		Loc Qty		Loc Code					
				ST359		1							
				123346		1							
				ST515		2							
				121185		2							
				ST517		671							
				124241		171							
				124805		315							
				124836		185							

DAS
66
9-89

FEB 11 2015

8x

Picklist Print

December-17-13 9:15:11 AM

Page 2

Work Order ID: 110108

Parent Item: D350-748-201

Parent Item Name: Aft Crosstube

Start Date: 12/17/13

Required Date: 12/17/13

Start Qty: 1.00

Required Qty: 1.00

AN4-6A Purchased No 220 Each 1,235.0000 16 16
BOLT

DAS 26 9-89
10
9-1

DAS 26 9-89

Location	Loc Qty	Loc Code
ST355	282	
123355	30	
M126175	2	
M127410	250	
ST514	953	
M126317	953	

AN5-32A Purchased No 220 Each 267.0000 4 4
Bolt

DAS 26 9-89

Location	Loc Qty	Loc Code
st503	267	
124215	218	
124805	5	
m127363	14	
m127550	30	

D3500-1 Manufactured No 220 Each 97.0000 4 4
Saddle

DAS 26 9-89

Location	Loc Qty	Loc Code
ST428A	12	
95810	12	
ST430A	66	
108799	40	
91888	8	
94620	18	
ST431	19	
95381	19	

DAS 26 9-89 FEB 11 2015
m119473
DAS 26 9-89

Picklist Print

December-17-13 9:15:11 AM

Page 3

Work Order ID: 110108
 Parent Item: D350-748-201
 Parent Item Name: Aft Crosstube

Start Date: 12/17/13

Required Date: 12/17/13

Start Qty: 1.00

Required Qty: 1.00

D3501-1 Manufactured No
 Bushing

220 Each 485.0000 16

16 DAS 26 9-89 FEB 11 2015

Location	Loc Qty	Loc Code
ST043	160	
86913	160	
ST051	2	
103038	2	
ST052	323	
104369	80	
105395	90	
105576	40	
88532	1	
95165	112	

DAS
 06
 1-89

m/20509
 DAS
 46

D3502-1 Manufactured No
 Support

200 Each 79.0000 2 2

DAS 41 9-89 15-2-7

Location	Loc Qty	Loc Code
LG050	79	
104334	6	
73419	3	
74873	1	
86876	1	
88465	24	
94722	20	
97212	12	
99764	12	

121096

2

Picklist Print

December-17-13 9:15:11 AM

Page 4

Work Order ID: 110108

Parent Item: D350-748-201

Parent Item Name: Aft Crosstube

Start Date: 12/17/13

Required Date: 12/17/13

Start Qty: 1.00

Required Qty: 1.00

D350-748-241TRN

Manufactured No

110

Each

10.0000

1

1

Crosstube Turning Detail

113990

Location

Loc Qty

Loc Code

LG014

10

103241

1

105672

1

105674

1

105675

1

105677

1

79392

1

86988

1

89962

1

97874

1

97879

1

DAS

41

9-89

15-2-7

D3595-063-395

Manufactured No

200

Each

130.0000

2

2

Rubber Cushion

115027

Location

Loc Qty

Loc Code

FG

5

87353

5

LG051

125

100373

7

102441

6

102890

3

105542

14

108010

36

109481

20

87353

17

94602

1

97526

17

98361

4

Picklist Print

December-17-13 9:15:11 AM

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Work Order ID: 110108
Parent Item: D350-748-201
Parent Item Name: Aft Crosstube

Start Date: 12/17/13

Required Date: 12/17/13

Start Qty: 1.00

Required Qty: 1.00

MS21042L4

Purchased

No

220

Each

4,214.0000

24

Locknut

DAS
26
9-89

Location

Loc Qty

Loc Code

FP001

38

122452

38

GA

30

m126333

30

ST314

9

m125708

9

st507

33

m126073

33

ST509

2008

m126275

114

m127255

1894

ST510a

85

m126333

85

ST518

2011

124231

154

m127376

1857

DAS
46
9-89

DAS
46
9-89

DAS
26
9-89

MS21042L5

Purchased

No

220

Each

840.0000

4

Nut

DAS
26
9-89

Location

Loc Qty

Loc Code

GA

5

117611

5

ST314

335

125535

335

ST509

500

m127304

500

FEB 11 2015

December-17-13 9:15:12 AM

Shop Packet Print

Page 5

Picklist Print

December-17-13 9:15:12 AM

Page 6

Work Order ID: 110108
Parent Item: D350-748-201
Parent Item Name: Aft Crosstube

Start Date: 12/17/13

Required Date: 12/17/13

Start Qty: 1.00

Required Qty: 1.00

MS21920-22 Purchased No

200 Each 103.0000

2

2

DAS

441

9889

15-2-7

Clamp

Location

Loc Qty

Loc Code

LG050

103

125487

5

M126420

4

M126637

4

M127255

40

M127608

50

DAS

41

9-89

15-2-7

MS27039-1-10
SCREW

Purchased No

200 Each 382.0000

1

1

Location

Loc Qty

Loc Code

GA

100

120449

100

ST305

26

122815

1

123522

18

125654

7

ST506

256

124326

10

m126474

246

DAS

41

9-89

15-2-7

NAS1149D0363J
Washer

Purchased No

200 Each 4,179.0000

1

1

Location

Loc Qty

Loc Code

GA

89

124392

89

ST294

11

113068

11

ST510a

4079

m126319

4079

Picklist Print

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Work Order ID: 110108
Parent Item: D350-748-201
Parent Item Name: Aft Crosstube

Start Date: 12/17/13 Required Date: 12/17/13
Start Qty: 1.00 Required Qty: 1.00

NAS1149D0463J Purchased No

220 Each 5,122.0000 32

32 m130799

DAS 26 9-89

WASHER

DAS
66
9-89

Location	Loc Qty	Loc Code
ST294	143	
119097	1	
121912	24	
124198	35	
124778	83	
ST510a	4979	
M126221	22	
M127693	4957	

DAS
46
9-89

NAS1149D0563J Purchased No

220 Each 4,123.0000 8

8 FEB 11 2015

Washer

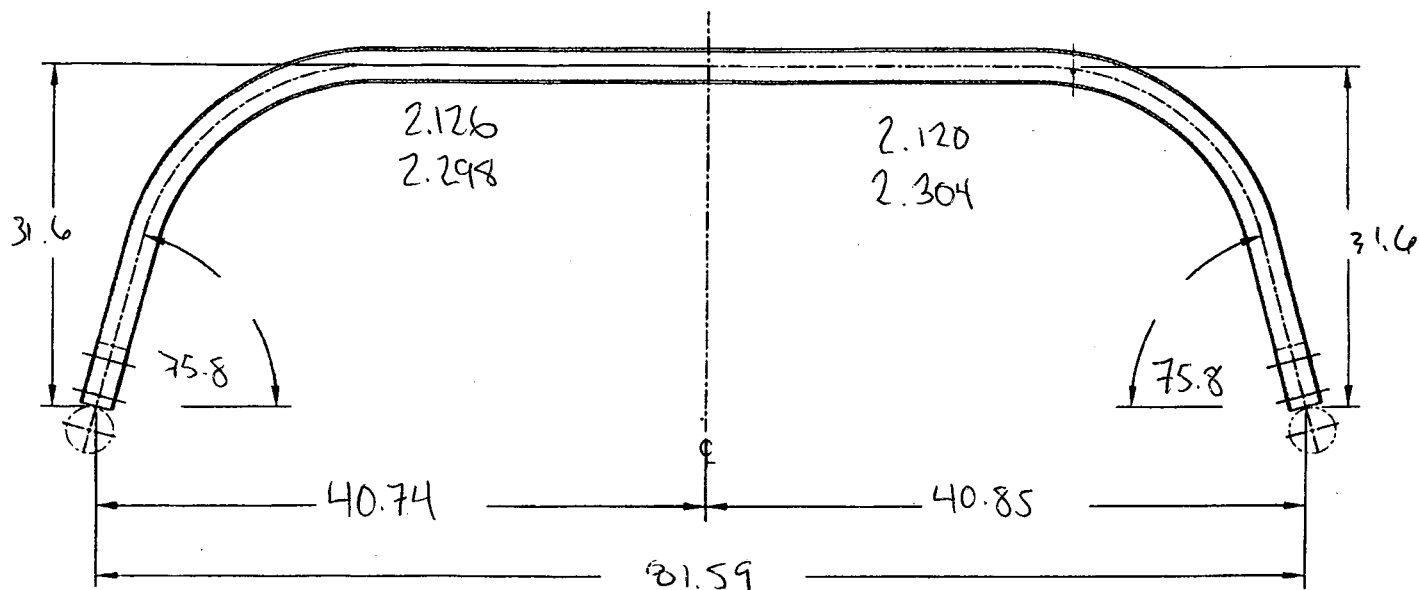
Location	Loc Qty	Loc Code
GA	35	
m125807	35	
ST294	145	
122452	91	
123248	42	
123355	12	
ST510a	3943	
m126319	3943	

m130799 DAS 46 9-89

DAS
66
9-89

DART AEROSPACE LTD	Work Order: 110108 113064	
Description: Crosstube High Aft (AS350/355)	Part Number: D350-748-201	
Inspection Dwg: D350-748-241 Rev: G		Page 1 of 1

Required Dimension	Min	Max
Height	31.22	31.48
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06
Bending Passes	7	--
Crushing	--	6%
Twist	--	0.25



	Side A	Side B
Bending Passes	36	36
Crushing	3.9%	4.2%
Comments		
Overall width OK, Acceptable		
DAS 12 14/8/28		

QC15 Inspection	<i>[Signature]</i>
Date	14-8-28

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	12.04.16	Added bending, crushing & twist dimensions	KJ	
D	12.07.31	Dwg Rev updated	KJ	
E	13.02.27	Dwg Rev updated	KJ	<i>[Signature]</i>

Item	Qty -241	Part Number	Description
1	X	D350-748-241	CROSSTUBE ASSEMBLY (AS 350/355 HI AFT)
2	1	D6015-125	CROSSTUBE (OR D6018-125)
3	2	D3502-1	SUPPORT
4	2	D3595-063-395	RUBBER CUSHION
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-22 OR MS21920-21	CLAMP (PER DART SPEC. M-MS21920-21/-22)
8	1	MS27039-1-10	SCREW
9	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6018-125
FINISHED LENGTH AFTER TURNING = 124.70±0.06 (AFTER BENDING/TRIMMING = 122.70 REF)
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCE: PER DART QSI 018 UNLESS OTHERWISE NOTED.
WALL THICKNESS ECCENTRICITY PER DART QSI 038 7.2
MIN. ALLOWABLE WALL IS -0.020 FROM NOMINAL
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-241" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 29.85 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.

TURNING

- 10) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS2759/1E AFTER TURNING. ACCEPTABLE TO VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.

BENDING

- 12) ALL DIMENSIONS FOR BENT TUBE ARE POST STRESS RELIEF
- 13) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES PER SIDE. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D. ON TOP HALF OF BEND, AND 7% ON BOTTOM HALF OF BEND.
- 14) MAX AMPLITUDE OF RIPPING ALONG BENT PORTION OF THE TUBE IS 0.030 (ZN A1-3)
- 15) AFTER BENDING, STRESS RELIEVE TUBE AT 650°F ±0.25°F FOR A MINIMUM OF 2 HRS AND ALLOW TO COOL TO AMBIENT TEMPERATURE (REF AMS2759/1E).
- 16) MAX TWIST AFTER STRESS RELIEF: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.38 (ZN C1-3).

ASSEMBLY

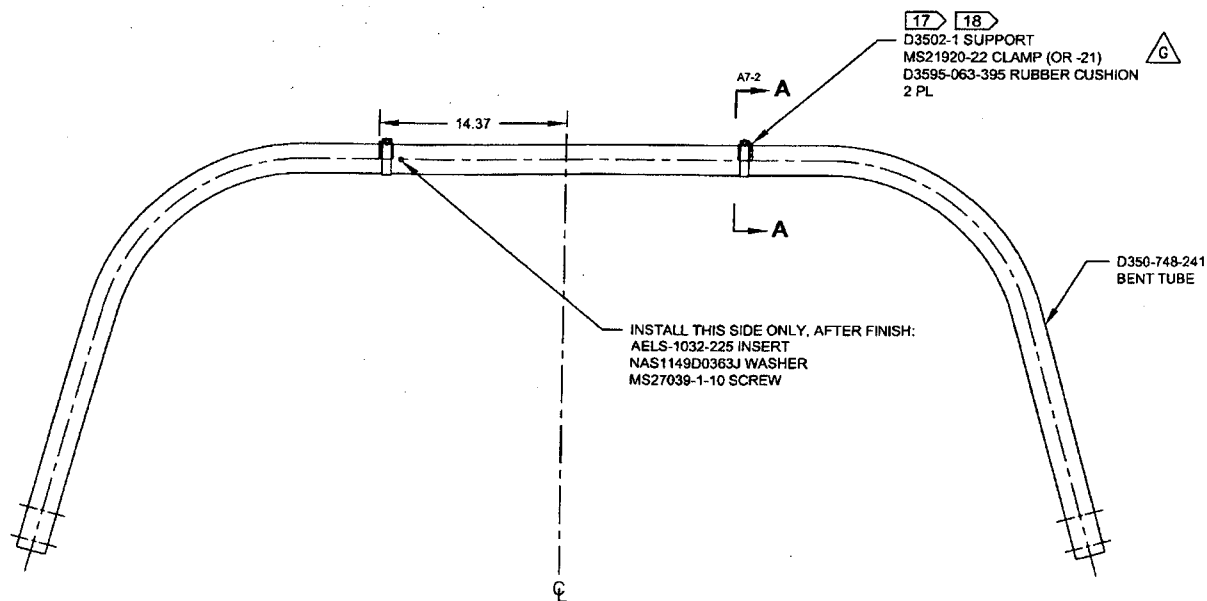
- 17) TO INSTALL D3502-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.02" TO 0.05" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 18) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

110108 MJS
13-12-19

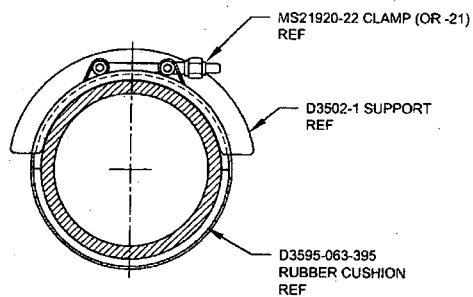
RELEASE
2012-11-01

G	RMV ABRASION STRIP, SUPPORT NOW W/ PROSEAL & CUSHION. ADD STRESS RELIEF, LONGER CUFF, NOW TRIM'D AFTER BEND, ADD WALL DIMS & UPDATE TOL.	CP	12.09.12
F	ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES; UPDATE TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A8-3); ADD TOLERANCES (ZN C8-3, D2-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6018-125 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	12.09.12		
DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA DRAWING NO. D350-748-241 TITLE CROSSTUBE (AS 350/355 HI AFT) REV. G SHEET 1 OF 4 SCALE NTS COPYRIGHT © 2008 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

8 7 6 5 4 3 2 1



**D350-748-241
ASSEMBLY DETAIL**

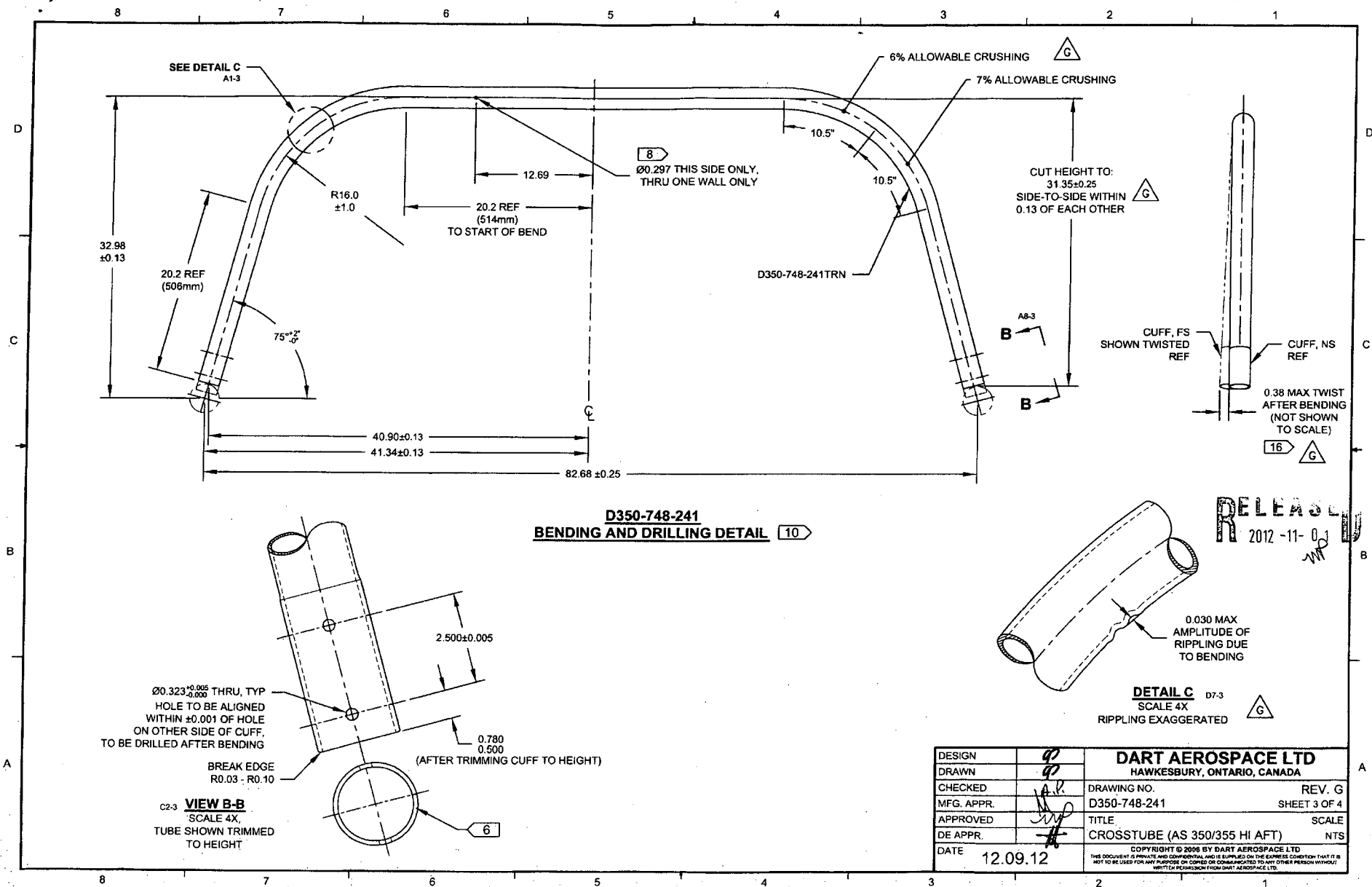


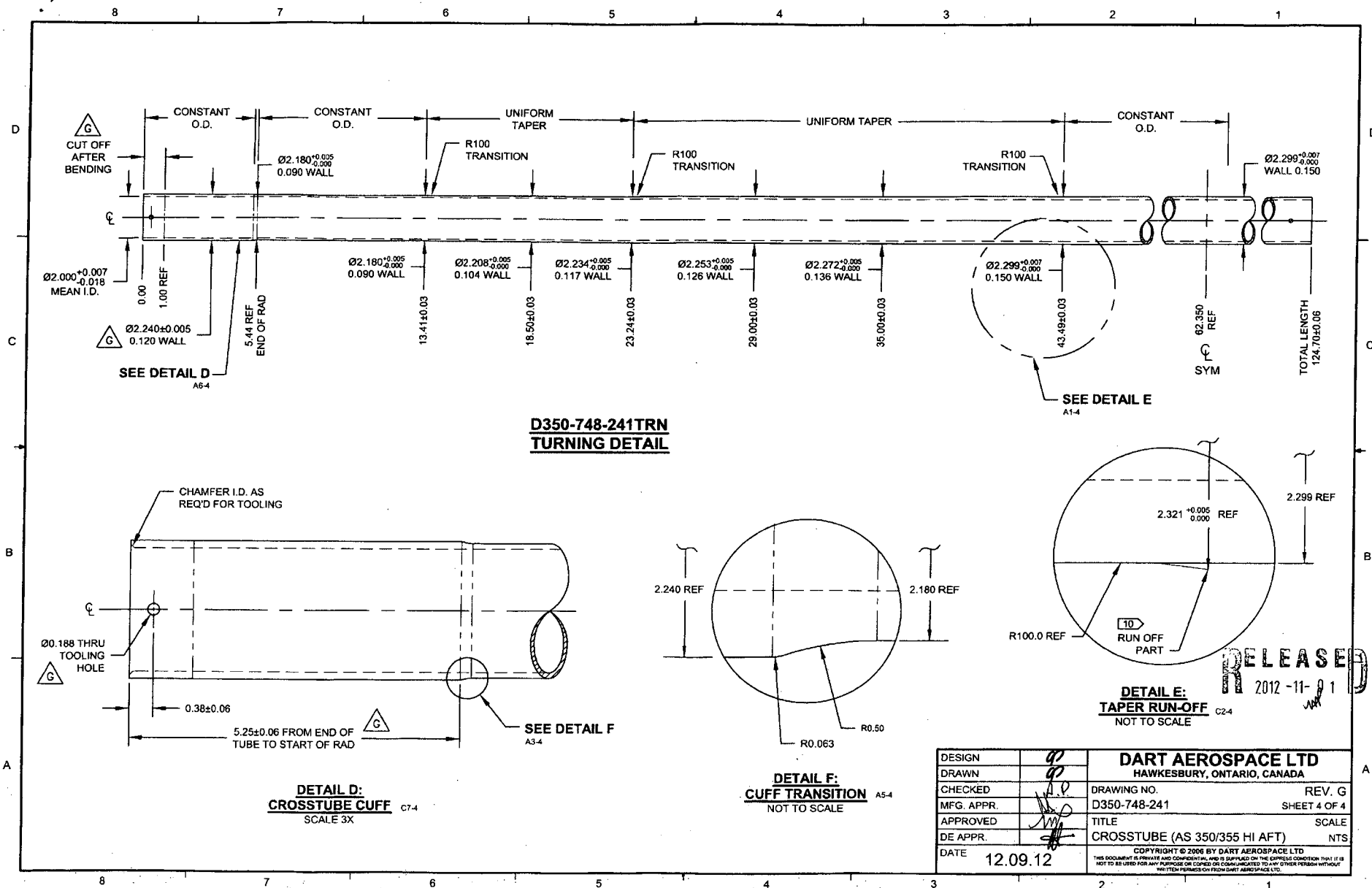
SECTION A-A D4-2
SCALE 6X

RELEASED
2012-11-01

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. G
MFG. APPR.		D350-748-241	SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	12.09.12	COPYRIGHT © 2006 BY DART AEROSPACE LTD	
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

8 7 6 5 4 3 2 1

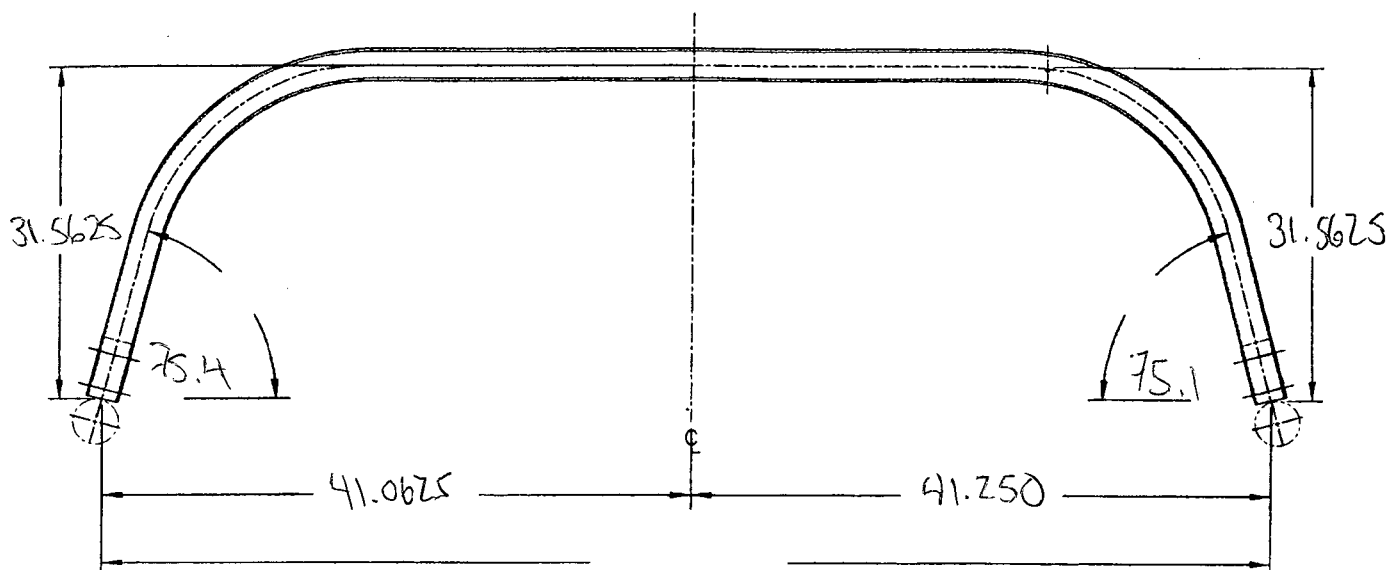




Before De-stress

DART AEROSPACE LTD		Work Order:	
Description: Crosstube High Aft (AS350/355)		Part Number:	D350-748-201
Inspection Dwg: D350-748-241	Rev: G	Page 1 of 1	

Required Dimension	Min	Max
Height	31.22	31.48
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06
Bending Passes	7	--
Crushing	--	7%
Twist	--	0.38



	Side A	Side B
Bending Passes	36	36
Crushing		
Comments		
twist < 0.067		

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	12.04.16	Added bending, crushing & twist dimensions	KJ	
D	12.07.31	Dwg Rev updated	KJ	
E	13.02.27	Dwg Rev updated	KJ	
F	14.02.13	Crushing & twist dimensions revised	KJ	

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ, ST-EUSTACHE, QC, J7R 5A8

Tél.: 450-473-1884

Télécopieur / Fax administration: 450-491-5498

Télécopieur / Fax production: 450 491-6454

Rapport d'Inspection**Inspection Report**

BON DE TRAVAIL order	CHARGEMENT load
198168	1

CLIENT / customer 215

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K8A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE

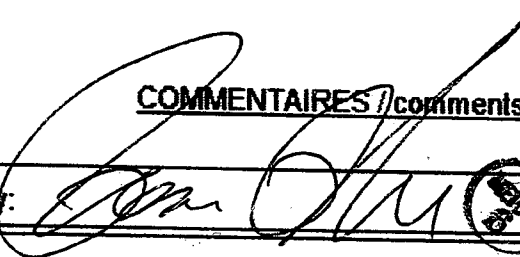
1270 ABERDEEN

HAWKESBURY

ON K8A 1K7

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	MAÎTRE D'OEUVRE prime contractor	PROGRAM
25480		Steel		
SPECIFICATIONS DU PROCÉDÉ processing specifications STRESS REL SAE AMS 2759/1 REV.E				
EXIGENCE / requirement SPECIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results Visual				

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
5	195	D350-748-201 (1) D350-748-201 REF. 110107 (1) D350-748-201 REF. 110108 (1) D350-748-201 REF. 113064 (1) D350-748-201 REF. 113065 (1) D350-748-201 REF. 113066 1 NIL

COMMENTAIRES / commentsAPPROUVÉ par / Approved by: 

DATE: 2014-08-22

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ, ST-EUSTACHE, QC, J7R 5A8

Tél.: 450-473-1884

Télécopieur / Fax administration: 450-491-5498

Télécopieur / Fax production: 450 491-6454

Certificat de Conformité Détaillé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
198168	1

CLIENT / customer 215

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

1

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	MAÎTRE D'OEUVRE prime contractor	PROGRAM
25480		Steel		
SPÉCIFICATIONS DU PROCÉDÉ processing specifications				
STRESS REL				
SAE AMS 2759/1 REV.E				
EXIGENCE / requirement SPÉCIFICATIONS / specified TESTS EXÉCUTÉS / performed RÉSULTATS DE TESTS / results				
Visual				
QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description		
5	195	D350-748-201 (1) D350-748-201 REF. 110107 (1) D350-748-201 REF. 110108 (1) D350-748-201 REF. 113064 (1) D350-748-201 REF. 113065 (1) D350-748-201 REF. 113066 1 NIL		

COMMENTAIRES / comments

STRESS RELIEF 343C, 2 HRS

Heat treatment (HT) was performed with equipment that meets the requirements of AMS2759.

All HT operations were in compliance with AMS2759 and all verifications have been performed and documented. No unauthorized changes were performed in regards to the HT. We certify that the material was manufactured, sampled, tested and inspected in accordance with AMS2759 and the purchase order and was found to meet the requirements.

Le traitement thermique (TT) a été fait en utilisant des équipements en conformité avec AMS2759.

Le TT a été fait tel que requis par AMS2759 et toutes les vérifications et les tests demandés ont été faites et documentés. Aucun changement n'a été faite par rapport au TT. On certifie que le matériel a été fabriqué, échantillonné, testé et inspecté en accord avec AMS2759 et le bon de commande et le matériel rencontre les exigences spécifiées.

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ, ST-EUSTACHE, QC, J7R 5A8

Tél.: 450-473-1884

Télécopieur / Fax administration: 450-491-5498

Télécopieur / Fax production: 450 491-6454

Certificat de Conformité Détaillé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
198168	1

CLIENT / customer 215

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

APPROUVÉ par / Approved by:

DATE: 2014-08-25

Isabel Otero
QA Technician





Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID PO26611

Purchase Order Date 11/25/2014

PO Print Date 11/25/2014

Page Number 3 of 5

Order From :

VC-CAD002

Ship To : DART AEROSPACE LTD

CADORATH COATING
1150 LOGAN AVE.
WINNIPEG, MB R2R 0J2
CAN

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name

Buyer

Chantal Lavoie

Vendor Phone

204 633 9420

Customer POID

Customer Tax #

10127-2607

Ship To Contact

Terms

Net 30

Ship To Phone

Currency

CAD

Ship Via:

Day & Ross collect

FOB

Destination-Collect

Ship Acct:

12288	D350-748-101 CROSSTUBE	12/19/2014	1.00	\$803.42	\$803.42
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Yes

12/19/2014

FINISH SAME AS ABOVE

Line Total: \$803.42

12106	D350-748-201 CROSSTUBE	12/19/2014	1.00	\$803.42	\$803.42
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Yes

12/19/2014

FINISH SAME AS ABOVE

Line Total: \$803.42

110108	D350-748-201 CROSSTUBE	12/19/2014	1.00 ✓	\$803.42	\$803.42
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Yes

12/19/2014

FINISH SAME AS ABOVE

Line Total: \$803.42

8015-01-27

Note:

11/25/2014

Packing Slip



Cadorath Coating

2150 Logan Avenue, Winnipeg, Manitoba R2R-0J2

Phone: (204) 633-9420 Fax: (204) 633-8033

INVOICE NUMBER:

S 74804

Net 2% Interest Per Month charged on Overdue Accounts.

Any claims for shortages, overcharges, or damaged goods must be made within seven (7) days from receipt of goods.

Sold To:
Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7
ShipTo:

Customer Order #:	Date Received:	Terms:	G.S.T. #:	Ship Via:	Ship Date:
PO26611	Dec-31-2014	NET 30 DAYS	10071 6547 RT0001		Jan-22-2015

Item #	Qty	P/N & Description	
1	1 EA	CROSSTUBE	S/N 110171
		P/N d350-748-101	W/O 142527
2	1 EA	CROSSTUBE	S/N 110172
		P/N d350-748-101	W/O 142528
3	1 EA	CROSSTUBE	S/N 113097
		P/N d350-748-101	W/O 142529
4	1 EA	CROSSTUBE	S/N 113098
		P/N d350-748-101	W/O 142530
5	1 EA	CROSSTUBE	S/N 113062
		P/N D350-748-201	W/O 142531
6	1 EA	CROSSTUBE	S/N 113063
		P/N D350-748-201	W/O 142532
7	1 EA	CROSSTUBE	S/N 113067
		P/N D350-748-201	W/O 142533
8	1 EA	CROSSTUBE	S/N 110106
		P/N D350-748-201	W/O 142534
9	1 EA	CROSSTUBE	S/N 110108
		P/N D350-748-201	W/O 142535
10	1 EA	CROSSTUBE	S/N 121505
		P/N D350-748-101	W/O 142536
11	1 EA	CROSSTUBE	S/N 122288
		P/N D350-748-101	W/O 142537

SP15-01-27

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Jan-22-2015

CONSIGNEE TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 142535

INVOICE #: 74804

**CONTRACT OR
PURCHASE ORDER #** PO26611

DESCRIPTION: CROSSTUBE

QTY 1

P/N # D350-748-201

S/N # 110108

STRESS RELIEF BAKE HEAT CHART # 14-1216.MPI IAW ASTM-E-1444. CADMIUM PLATE IAW AMS-QQ-P-416C TYPE 2 YELLOW CLASS 1. FINAL MPI IAW ASTM-E-1444. EMBRITTLE RELIEF BAKE HEAT CHART # 15-38.

Sp15-01-27

CERTIFICATE: I certify that the items indicated here on have been inspected and tested and conform to all specifications and requirements detailed on the contract or purchase order.

Approved Inspector:





Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID PO27244

Purchase Order Date 1/28/2015

PO Print Date 1/29/2015

Page Number 5 of 7

Order From :
SKYSERVICE
6120 MIDFIELD ROAD
MISSISSAUGA, ONTARIO L5P 1B1
CANADA

VC-SKY001

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name

Vendor Phone 905-678-5636

Ship To Contact

Ship To Phone

Ship Via: Delivered

Ship Acct:

Buyer

Chantal Lavoie

Customer POID

Customer Tax # 10127-2607

Terms Net 30

Currency CAD

FOB FCA - (Free Carrier)

12	113067	D350-748-201 CROSSTUBE	1/29/2015	1.00	\$0.00	\$0.00
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Yes

1/29/2015

SAME AS ABOVE

Line Total: \$0.00

13	110106	D350-748-201 CROSSTUBE	1/29/2015	1.00	\$0.00	\$0.00
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Yes

1/29/2015

SAME AS ABOVE

Line Total: \$0.00

14	110108	D350-748-201 CROSSTUBE	1/29/2015	1.00 ✓	\$0.00	\$0.00
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Yes

1/29/2015

SAME AS ABOVE

815-01-29

Line Total: \$0.00

Note:

1/29/2015

**skyservice****Work Order Traveler**

Sky Service F.B.O. Inc.

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO21993	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: PO: 27244
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN: 0	CSN: 0	TSO: 0	
Task: UNSCHEDULED			Sequence: 1

Work Required:

CARRY OUT NDT ON THE FOLLOWING FWD CROSSSTUBES
ID # D350-748-101
WORK ORDER ID'S # 110172, 110171, 113092, 113098, 121505

CARRY OUT NDT ON THE FOLLOWING AFT CROSSSTUBES
ID # D350-748-201
WORK ORDER ID'S # 113063, 113062, 113062, 110106, 110108

Action Taken:	Date:	Initial/Stamp:
LIQUID PENETRANT INSPECTION CARRIED OUT ON ITEMS LISTED ABOVE IN ACCORDANCE WITH ASTM E-1417M-13 ANY SUSPECT INDICATIONS VERIFIED BY EDDY CURRENT.	JAN 27 2015	
DAB 3B 9-89 JAN 30 2015		

Description	Location	P/N	Qty	Batch	S/N Off	S/N On
LPI - ARDROK		970825E				
BLACK LIGHT		S/N: M-20142				
EDDY CURRENT		NORTEC 500,5		S/N: M-20323	CAL. 11/NOV/2015	

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:	ACA/SCA Stamp 	Date: JAN 27 2015
Name: RAFIK MELIKIAN		

SP15-01-29